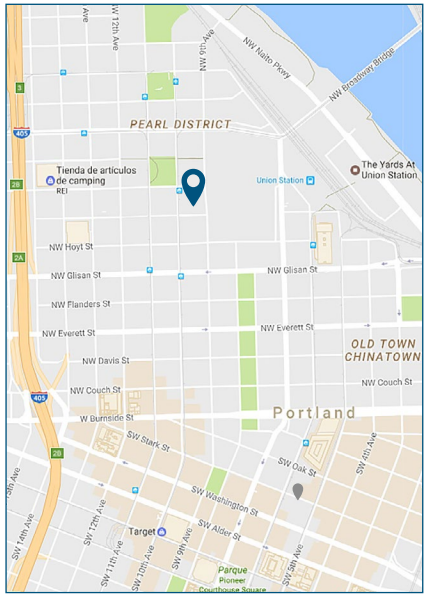

Aimsun
Portland, OR | June 15-16, 2017
North America
Aimsun Users' Meeting
& Training Course
TSS
TRANSPORT
SIMULATION
SYSTEMS

EVENT SUMMARY

Thursday June 15th	TSS sessions & user presentations Billy Frank Jr. Conference Center, Ecotrust Building **9:00 am - 5:30 pm** Rooftop reception 3rd Floor Outdoor Terrace, Ecotrust Building **5:30 -7:30 pm**
Friday June 16th	Aimsun training workshop "Multi-Resolution, Multi-Scenario Modeling" WeWork Custom House **9:00 am - 5:00 pm**

Ecotrust Building
721 NW 9th Ave #200
Portland, OR 97209

ecotrust.org
503-227-6225



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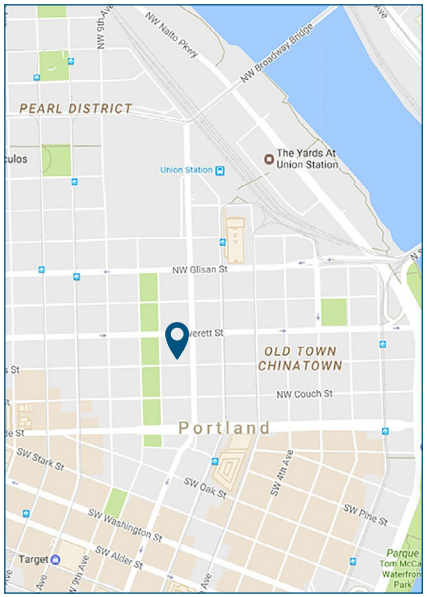

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wework

wework
WeWork Custom House
220 NW 8th Ave
Portland OR 97209

wework.com
503-809-2550

TSS TRANSPORT SIMULATION SYSTEMS

THURSDAY JUNE 15th

9:00 - 9:30	**REGISTRATION**
9:30 - 10:00	**New in 8.2** / Paolo Rinelli, TSS
10:00 - 11:00	**Large-Scale, Multi-Modal Model for the I-210 Pilot Integrated Corridor Management Systems** / Anthony Patire, California PATH, UC Berkeley / François Dion, California PATH, UC Berkeley
11:00 - 11:15	**BREAK**
11:15 - 11:45	**Traffic Technology and Modeling: a Winning Combination in Vegas** / Brian Hoeft, Freeway and Arterial System (FAST) of Transportation for the Regional Transportation Commission of Southern Nevada
11:45 - 1:15	**LUNCH** + lunchtime Oregon ITE SimCap Roundtable, featuring an Introduction to DTA modeling / Paolo Rinelli, TSS
1:15 - 1:45	**San Diego Region Mesoscopic Model Development** / Rick Curry, SANDAG
1:45 - 2:15	**The Case for Dynamic Design During Concept Development** / Will Hume, HDR
2:15 - 2:45	**Multi-resolution Modeling Methodology for Montreal** / Pascal Volet on behalf of Ville de Montréal
2:45 - 3:00	**BREAK**
3:00 - 3:15	**Modeling Connected and Autonomous Vehicles** / Paolo Rinelli, TSS
3:15 - 3:45	**Parlaying the Interstate 15 Microsimulation Model from Operations to Planning** / Rick Curry, SANDAG
3:45 - 4:15	**Making Traffic Data Accessible** / Eimar Boesjes, Moonshadow Mobile
4:15 - 4:45	**TomTom High Definition Maps and Aimsun Integration** / John Auble, TomTom
4:45 - 5:00	**BREAK**
5:00 - 5:15	**What's coming up for Aimsun** / Paolo Rinelli, TSS
5:15 - 5:30	**Feedback and Closing**
5:30 - 7:30	**ROOFTOP RECEPTION**

FRIDAY JUNE 16th

Aimsun training workshop: Multi-Resolution, Multi-Scenario Modeling

June 16th 2017, Portland, OR | WeWork Custom House | 9:00 am - 5:00 pm

A guided tour through the methodology and techniques for calibrating the base traffic demand (using static O/D adjustment, departure time adjustment, and dynamic O/D adjustment) and for calculating the base equilibrium paths (using dynamic user equilibrium (DUE) with incremental load).

This workshop also covers coding of future scenarios (using geometry configurations) to see how changes affect the path assignment (using APA fixer and continuing the DUE).

Tutor: Paolo Rinelli

WORKSHOP:

1. Multi-resolution modeling project workflow
2. Routing (cost) consistency
3. Demand preparation
4. Techniques for improving the convergence of a DUE assignment
5. Scenario management
6. Modeling the transition to a new equilibrium after network modifications

PRESENTATION ABSTRACTS

Large-Scale, Multi-Modal Model for the I-210 Pilot Integrated Corridor Management System

François Dion, California PATH, UC Berkeley

Anthony D Patire,
California PATH, UC Berkeley

As part of the Connected Corridors program, the California Department of Transportation is currently working on the deployment of a pilot Integrated Corridor Management (ICM) system along a portion of the I-210 freeway in north Los Angeles County.

To support the operation of the Decision Support System at the heart of the envisioned ICM system, PATH has been developing a multimodal, large-scale Aimsun model of the corridor to be managed. This model covers a 14-mile section of the I-210 freeway and includes all main urban roadways and transit services within a 2- to 4-mile cross-section, depending on the location. Its purpose will be to:

(1) Inform the process of building incident response plans
(2) Score a proposed response plan for use by the Decision Support System in real time
(3) Improve response plans and prediction capabilities, and
(4) Inform other special planning needs

This presentation will present an overview of the model being developed, with a particular focus on issues related to the calibration of the model and its eventual use in a real-time context.

Traffic Technology and Modeling: A Winning Combination in Vegas

Brian Hoeft, Freeway and Arterial System of Transportation (FAST) for Transportation for the Regional Transportation Commission of Southern Nevada

In addition to helping with the first use of Aimsun in Las Vegas, the Freeway and Arterial System of Transportation (FAST) is also working on several other firsts, as technology and access to big data quickly integrate into our profession. For example, in late 2016 FAST teamed with Traffic Tech Services, an Oregon company, and Audi to deploy countdown to green in Las Vegas in 2017 Audis. This triggered substantial data sharing of data from 1,400 traffic signals.

In collaboration with the Nevada Department of Transportation and Nevada Highway Patrol, FAST is working with technology start-ups WayCare and Nexar, two Israeli firms, also with offices in the Bay Area, to pilot and deploy predictive and artificial intelligence services that will address roadway incidents and congestion. Again, use of substantial amounts of data from varied sources is involved.

FAST is also collaborating with FHWA, Purdue University, and the Utah DOT to collect, evaluate, and benefit from high-resolution and mobile source data.

San Diego Region Mesoscopic Model Development

Rick Curry, SANDAG
Murat Ayçin, TSS
Pascal Volet, TSS
Mariya Maslova, WSP|PB

The San Diego Association of Governments (SANDAG), with WSP/PB and TSS-Transport Simulation Systems, are working on an ambitious project of creating a San Diego County-wide mesoscopic traffic simulation model in Aimsun. SANDAG maintains and continuously develops a suite of model tools aimed at providing greater temporal, spatial, economic, and demographic detail to decision makers for directing future transportation policy. The 2050 Regional Plan calls for increased Transportation System Management (TSM) and Intelligent Transportation Systems (ITS) strategies to reduce traffic congestion, travel times, and air pollution. A Dynamic Traffic Assignment (DTA) model will be used to properly analyze the benefits of these strategies and to more effectively integrate with the fine temporal resolution of SANDAGs Activity-Based Model (ABM). The project has been divided into 2 phases, 1) creation of a regional DTA model (expected completion in mid-2017), and 2) integration with the ABM (projected for 2018/2019).

The creation of a San Diego regional DTA involved developing a process for network automation from the GIS network, collection of detailed geometric network attribute information, signal timing, and NEMA configurations for intersections, the calibration of networks, and validation at a fine temporal resolution for volumes and speeds.

The network automation process was important to tie the mesoscopic simulation network to the travel demand model for testing of scenarios, future years, and minimizing the duplicity of network updates. The Aimsun network has approximately 57,000 sections and 19,000 intersections of which 3,600 are signalized and roughly 320 are ramp meters.

Calibration of the network used a stepwise method, first debugging city wide geometries and signal timings, then aggregating to five large subareas, and finally working with the entire region. Debugging started with cycling through individual time periods (early AM, AM, midday, PM, night) before moving to a full 24-hour calibration. The model assigns the vehicle movements of over 3M people and 9M vehicle trips using a time based trip list rather than matrices by time and vehicle type. Validation was done using readily available freeway count data from PeMS and INRIX speeds for the freeways and arterials. Aimsun allows for a flexible temporal validation scheme using real data sets (RDS). Five-minute RDS data is being used to validate the model hour-by-hour or period-by-period.

The Case for Dynamic Design during Concept Development

Will Hume, HDR
Smith Siromaskul, HDR

This presentation will use a case study from a project currently in progress to highlight a unique approach to concept development. A typical project involves traffic engineering and roadway design working in sequence with some iterations, but typically working one at a time. This typical approach leads to inefficiencies and an opportunity for an improved and more collaborative approach. This presentation will highlight the benefit of Dynamic Design, an improved approach which incorporates microsimulation during concept development and streamlines traffic engineering and roadway design to occur concurrently and iteratively. The result is the ability to create truly innovative solutions that are often blends of multiple "innovative" concepts into one-of-a-kind solutions tailored to site-specific problems.

Innovative intersection concepts are not new however the latest in innovative intersection design incorporates several innovative elements not typically paired together to reduce the number of conflicting movements at an intersection. Research is underway to find a deterministic analysis method to allow for quick and easy analyses of concepts that involve the interaction of many parts and often the interconnection and progression of multiple signals. In practice, our deterministic analysis methods currently fall short leaving a choice of having either inaccurate analyses using existing methods and software that need to be "tricked" into doing what is needed, or the perception of excessively complicated simulation-based analyses that are time and work intensive to perform.

The case study to be discussed is US 192 in Central Florida. A 22-mile corridor conceptual plan, the traffic and roadway engineering was completed simultaneously which resulted in an innovative corridor utilizing displaced left turns, diverging diamond interchange geometry, median U-turns, and quadrant roads blended together that would be impossible to have been developed or to truly analyze using deterministic methods.

Multi-resolution Modeling Methodology for Montreal

Presented by Pascal Volet,
TSS on behalf of Ville de Montréal

The City of Montréal has been using Aimsun for its internal planning studies since 2010, piggybacking on the existing regional model from the province of Quebec's DOT (MTMDET): MOTREM.

The underlying network consists of every street on the Island, originating from a DMTI GIS database, which consists of 8478 km of streets, 25000 intersections (2300 signalized) and 858 traffic analysis zones (TAZ). This large network has been coded for macro and mesoscopic analysis, the 18 bridges giving access to the Island of Montreal acting as external zones.

The analytical methodology starts with the Island subarea hourly demand extracted from MOTREM for 24 hours and adjusted to the Bridge and Major screenline counts at the macro level. The next major step consists of the mesoscopic analysis of a large part of the island, usually as much as a third of the entire network, depending on the project location and mainly for the peak periods.
In this specific example, the project is a BRT development plan in the eastern part of the Island for the implementation of a 10km BRT along Pie-IX Blvd. The Aimsun subarea for this project covers 85 km2.

Other projects and their influence areas are also briefly presented:

- Re-development of the A440 Boulevard, West Island subnetwork
- Connection of Cavendish Blvd, Cavendish subnetwork
- Redefining major arterials, Plateau Mont-Royal subnetwork

Parlaying the Interstate 15 Microsimulation Model from Operations to Planning

Rick Curry, SANDAG

Peter Thompson, SANDAG

The United States Department of Transportation (USDOT) initiated the Active Transportation and Demand Management (ATDM) and the Dynamic Mobility Applications (DMA) programs to achieve transformative mobility, safety, and environmental benefits through enhanced, performance-driven operational practices in surface transportation systems management. In order to explore a potential transformation in the transportation system's performance, both programs require an Analysis, Modeling, and Simulation (AMS) capability to refine and integrate research concepts in virtual computer-based simulation environments prior to field deployments. Consequently, six simulation-based testbeds were developed to conduct research on DMA applications and ATDM strategies. They are San Mateo, Phoenix, Pasadena, Dallas, Chicago and San Diego.

This presentation documents the evaluation conducted on the San Diego Testbed, in which several ATDM strategies and DMA bundles were tested using the microscopic simulation level in Aimsun, a multi-resolution traffic modeling platform.

The ATDM strategies analyzed include: Dynamic Lane Use, Dynamic Speed Limits, Dynamic Merge Control, Predictive Traveler Information, Dynamic HOV/Managed Lanes, and Dynamic Routing.

The DMA applications tested consist of the Intelligent Network Flow Optimization (INFLO) bundle, including Dynamic Speed Harmonization (SPD-HARM) and Cooperative Adaptive Cruise Control (CACC).

Moonshadow Mobile

Making Traffic Data Accessible

Eimar Boesjes,
Moonshadow Mobile, Inc

Moonshadow Mobile has developed DB4IoT: a database engine purpose-built for the Internet of Moving Things (IomT).

Moving vehicles generate enormous amounts of data. IomT data isn't Big Data, it is Bigger Data. To look at moving vehicles at a resolution of less than one meter of movement you need 50 measurements per second. At this rate a single car generates 180,000 timestamped records per hour of driving. To look at traffic flows at the micro level you need to be able to visualize databases with hundreds of millions of records.

DB4IoT can instantly visualize databases with thousands of moving objects and hundreds of millions of records. The data can come from actual measurements on the vehicles or from modeling software such as Aimsun. Moonshadow will demonstrate DB4IoT through an example right here in Portland with TriMet. In this presentation Moonshadow will show how it is providing TriMet staff with tools to look at detailed movement data from 700 buses.

DB4IoT is provided as a SaaS online, where Moonshadow provides all the necessary server hardware. DB4IoT can work with any data stream, real-time or batch uploaded, that contains a vehicleID, timestamp, latitude, longitude and any other associated data such as speed, direction, fuel usage, etc. In this way DB4IoT can take in micro-level data from modeling software and visualize this. Data from different sources such as modeling software, vehicle driving data or data from mobile apps can be combined in a single DB4IoT database. DB4IoT can be uploaded through a RESTful API or through batch files. The APIs allow maps, images, graphs, table or actual data to be exported at extremely high speeds.

In addition to a PowerPoint presentation, Moonshadow will give a live demo of DB4IoT with traffic data at NAAUM 2017.

For more information visit: http://db4iot.com/

TOMTOM

TomTom High Definition Maps and Aimsun Integration

John Auble,
Government Programs, TomTom

Autonomous Driving (AD) is changing the way we map our transportation network. Though AD is many years away from being a standard option, its impact is already being felt in today's map.

This presentation will review how the path toward AD has changed how we product data at TomTom and discuss the immediate impacts on today's users. These will include both changes to the map products that we already produce and how the collection of source data is changing the landscape for mobile mapping data.

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